MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for April, 1904, is based on data from about 3300 stations, classified as follows:

Weather Bureau stations, regular, telegraph, and mail, 167; West Indian Service, cable and mail, 4; River and Flood Service, regular 43, special river and rainfall, 190, special rainfall only, 56; voluntary observers, domestic and foreign, 2565; total Weather Bureau Service, 3025; Canadian Meteorological Service, by telegraph and mail, 20, by mail only, 13; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Company, 96; Hawaiian Meteorological Service, 75; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25; The New Panama Canal Company, 5; Central Meteorological Observatory of Mexico, 20 station summaries, also printed daily bulletins and charts, based on simultaneous observations at about 40 stations; Mexican Federal Telegraph Service, printed daily charts, based on about 30 stations.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. R. C. Lydecker, Territorial Meteorologist, Honolulu, Hawaii; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander H. M. Hodges, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San José, Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Secretary, Meteorological Office, London; Rev. José Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Enrique A. Del Monte, Director of the Meteorological Service of the Republic of Cuba.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is 157° 30′, or $10^h\ 30^m$ west of Greenwich. The Costa Rican standard meridian is that of San José, $5^h\ 36^m$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

During April, 1904, barometric pressure was low over the British Isles and high over the middle longitudes of the Atlantic Ocean.

In the United States barometric disturbances were deficient in seasonal energy and, with one or two exceptions, were abnormally slow and erratic in their movements.

The first noteworthy American disturbance appeared on the eastern Rocky Mountain slope on the 6th and reached the Mississippi Valley on the 7th. On the morning of the 8th the disturbance was central over Iowa, with reported barometric minimum, 29.12 inches, at Des Moines. Heavy rain had fallen in the Mississippi, Ohio, and lower Missouri valleys, and the east Gulf States, and high winds were general throughout the central valleys and the upper Lake region. On the morning of the 9th the disturbance was central over the southern end of Lake Michigan, with barometric pressure 29.44 at Chicago. Snow was falling in the upper Lake region and upper Mississippi Valley, the rain area had extended to the north Atlantic coast, and freezing temperature was reported in the West and Northwest. During the 9th the disturbance moved northeastward over Michigan with rapidly diminishing strength.

A disturbance of moderate intensity moved eastward over the Great Lakes during the 11th.

On the 15th a disturbance moved rapidly eastward over the Mississippi and Ohio valleys, and reached the southeastern New England coast on the morning of the 16th, attended by high winds that attained a velocity of 72 miles an hour from the northwest at New York. By the evening of the 16th the center of disturbance had disappeared in the direction of Newfoundland. The passage of the storm was attended by heavy snow and high winds in the Lake region, in anticipation of which the following warning, based upon the morning reports of the 15th, was telegraphed to lower Lake stations:

> Heavy snow and high easterly shifting to northerly winds indicated for the lower Lake region to-night.

By the morning of the 16th three to twelve inches of snow had fallen in the Lake region.

From the 23d to the 27th a disturbance moved slowly eastward from the Plateau region to the Virginia coast, attended throughout its course by heavy rain and high winds. On the 24th severe local storms and torrential rains were reported in areas in the West and Southwest, and freshets occurred in the smaller streams of eastern Kansas. During the 25th heavy rain continued in the lower Missouri Valley, causing rivers to rise rapidly. Along the smaller streams of that section considerable farm property was flooded. At Jefferson City, Mo., the Missouri River rose above the danger line. On the 26th the Mississippi River at St. Louis reached a stage of 31.5 feet, and the river continued to rise at that point until 6 p. m. of the 29th, when a stage of 33.6 feet was reached. The usual advices regarding the rise in the lower Missouri and the Mis-